Some of the things that I do while teaching the scientific method is to stress that hypotheses are just that educated guesses about what you think will happen. I have found some labs that I feel help reinforce the idea that it is what you learn from the outcome, not whether or not your hypothesis was correct, that is important. Another thing is what makes an experiment valid. Students need to know how important it is that they only change one variable.

The Penny Lab found in the LTF material is a great one for this. It helps students to realize that even if they are off by a large number, they learned from the experience. They will learn that the type of dropper, how much pressure is used in dropping the water, etc. affect the outcome. It really reinforces the concept of one variable. You can even talk about valid and invalid experiments because the results will be all over the place. I think it is great.

Another lab I found, I call the *Air Experiment*. This one is great. You give the students an empty, clean, dry 2 liter bottle, a small piece of folded paper small enough to sit on the lip of the bottle, a hair dryer. When we start I kind of lead them to believe that this is an experiment to be sure they understand how to write a hypothesis using *If, then, because…* I give them the question:  *What affect does air have on a piece of paper sitting on the lip of a bottle?* (You may have a better way to word it.) We discuss the procedures. I tell them that they will turn the hair dryer on the low/cool setting. Before they turn it on I make sure they understand that it must be pointed directly at the lip of the bottle, no angles. I ask them to think about what they think will happen. I give them time to create their hypothesis, then, have everyone do the experiment at the same time. Very few, if any students will know that because the bottle is already full of air that the paper will fall out and not go in the bottle. They love this one and I do too because I can ask about why the paper didn’t go in. If anyone’s paper does go in I can go over how important it is to follow instructions because they didn’t point it directly at the lip of the bottle. We can talk about what they learned in spite of the fact that they may have had a different idea about what would happen. And, we discuss how their hypothesis was or was not supported.